

CLAIMS

1. A method of backing up a ring optical telecommunications network including a traffic concentrator (1) and a communications node (N3) interconnected by an optical fiber (2) of the network, the concentrator sending optical signals (s1, s2) transported in the fiber and addressed to the node, characterized in that it consists in using the same fiber in one direction (s1) when the network is in a normal transmission state and in the opposite direction (s2) when the network is in a back-up transmission state.
2. A communications node (N1, N3, N4) of a backed up ring optical telecommunications network, comprising:
- an optical fiber section (2c, 2e, 2f) for transporting optical signals (s1, s2), and
 - extraction means (10, 30, 40) for extracting optical signals transported by the fiber section, characterized in that, to allow the use of the same section of fiber in one direction (s1) when the network is in a normal transmission state and in the opposite direction (s2) when the network is in a backed up transmission state, the extraction means (10, 30, 40) are of the power coupler type and are bidirectional, and in that it further comprises:
 - switching means (11, 31, 41) for directing optical signals extracted by the extraction means, and
 - control means (12, 32, 42) for detecting the transmission state of the network and controlling the switching means as a function of that state.
3. A communications node (N1, N3, N4) according to claim 2, characterized in that it comprises an optical gate (13, 33, 43) controlled by the control means (12, 32, 42) and inserted into the fiber section (2c, 2e, 2f) to pass or eliminate optical signals.

4. A communications node (N1, N3, N4) of a backed up ring optical telecommunications network, comprising:

- an optical fiber section (6c, 6e, 6f) for transporting optical signals, and

- 5 - insertion means (100, 300, 400) for inserting optical signals into the fiber section,

characterized in that, to allow the use of the same section of fiber in one direction (s1) when the network is in a normal transmission state and in the opposite

10 direction (s2) when the network is in a backed up transmission state, the insertion means (100, 300, 400) are of the power coupler type and are bidirectional, and in that it further comprises:

- switching means (110, 310, 410) for directing optical signals to be inserted into the fiber section toward the insertion means, and

- control means (120, 320, 420) for detecting the transmission state of the network and controlling the switching means as a function of that state.

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5. An amplified communications node (N2, N5) of a backed up ring optical telecommunications network, comprising:

- at least one optical fiber section (2d, 6d, 2g, 6g) for transporting optical signals, and

- 25 - amplifier means (24, 240, 54, 540) for each fiber section inserted into the associated fiber section to amplify optical signals,

characterized in that, to allow the use of the same section of fiber in one direction (s1) when the network is in a normal transmission state and in the opposite direction (s2) when the network is in a backed up transmission state, it further comprises:

- switching means (21, 210, 51, 510) for each fiber section, inserted into the associated fiber section, for directing optical signals toward the associated amplifier means, and

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- control means (22, 220, 52, 520) for detecting the

transmission state of the network and controlling the switching means as a function of that state.

6. An amplified communications node (N2, N5) according to
5 claim 5, characterized in that it comprises power coupler
type extraction means (20, 50) for extracting downlink
optical signals transported by the fiber section of the
network (2d, 2g) dedicated to transporting downlink
signals.

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7. An amplified communications node according to either
claim 5 or claim 6, characterized in that it comprises
power coupler type insertion means (200, 500) for
inserting uplink optical signals into the fiber section
15 of the network (6d, 6g) dedicated to transporting uplink
signals.

8. A traffic concentrator (H1, H2) of a backed up ring
optical telecommunications network, characterized in
20 that, to allow the same section of fiber to be used in
one direction (s1) when the network is in a normal
transmission state and in the opposite direction (s2)
when the network is in a standby transmission state, it
comprises:

25 - two separate sections of a first optical fiber (2a, 2b,
2a', 2b'),

- switching means (110A to 112B) connected to one end of
each of the sections of the first fiber to inject into
these two ends substantially identical optical signals
30 addressed to nodes of the network,

- switching means (600) connected to one end of each of
the sections of the second fiber to receive via one of
those two ends an optical signal sent by a node of the
network, and

35 - control means for detecting the transmission state of
the network and controlling the switching means as a
function of that state.

9. A traffic concentrator (H1) according to claim 8, characterized in that the switching means (110A to 112B) comprise optical switches operating two by two.

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10. A traffic concentrator (H2) according to either claim 8 or claim 9, characterized in that the switching means (600) comprise three-state optical switches forming a quadripole A, B, C, D and allowing optical signals to propagate between the four poles in any of the following three propagation modes:

- between the poles A and B, on the one hand, and between the poles C and D, on the other hand, corresponding to a direct propagation mode;
- 15 • between the poles A and C, on the one hand, and between the poles B and D, on the other hand, corresponding to a crossed propagation mode;
- between the poles A and D, on the one hand, and between the poles B and C, on the other hand, corresponding to a transparent propagation mode.

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